UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/625,802	07/26/2000	William J. Dally	2789.2006-001	8246

21005 7590 06/06/2003

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER
BROWN, VERNAL U

ART UNIT	PAPER NUMBER
2635	

DATE MAILED: 06/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/625,802	DALLY ET AL.	
	Examiner	Art Unit	
	Vernal U Brown	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is responsive to communication filed on April 04, 2003.

Response to Amendment

The examiner has acknowledged the amended claims 5, 11 and the addition of claims 22 and 23.

Response to Arguments

Applicant's arguments filed April 8, 2003 have been fully considered but they are not persuasive.

Regarding applicant's argument concerning placing a clock regenerative amplifier and a low swing driver in a circuit Upp teaches a clock regenerative circuit in figure 3. Upp further teaches the use of a 2.5v (figure 3) which is considered as low voltage. It is further necessary to use a driver to drive the clock and data lines of the crosspoint switch in Upp. Bridgewater is use to show the use of low swing voltage to drive clock and data lines (col. 3 lines 17-19).

Regarding applicant's argument concerning claim 4, the clock regeneration circuitry of figure 3 is included in the crosspoint switch of Upp (col. 3 lines 35-37). The reference of McClure is relied upon to show a clocked regenerative amplifier.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5-6, 9, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551.

Regarding claims 1 and 3, Upp teaches a crosspoint switch (figure 1) comprising a plurality of input and output busses (figure 1) but is silent on teaching the input and output busses are driven at low swing. Bridgewater, Jr. in an art related Low Voltage Differential Dual Receiver invention with a plurality of input and output buses teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19).

It would have been obvious to one of ordinary skill in the art to have input and output busses driven at low swing in Upp as evidenced by Bridgewater, Jr. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches low-voltage swing input and output busses and low-voltage swing busses are widely used in the art as a means of lowering the power consumption switching circuitry (col. 4 lines 34-40).

Regarding claim 5, Upp teaches a timing circuit which controls timing of the crosspoint switch from a clock (figure 3). Upp further teaches an amplifier (87) and an integrator which inherently introduces a delay.

Regarding claim 6, Upp is silent on teaching the signals on the input buses and the output buses are differential signals. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19).

It would have been obvious to one of ordinary skill in the art for the signals on the input buses and the output buses are differential signals in Upp as evidenced by Bridgewater, Jr. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches the use of low-voltage swing receiver in order to improve bus performance because the amount of time to generate a voltage differential is significantly less than the time required to transition from the supply voltage to the zero level.

Regarding claim 21, Upp teaches a crosspoint switch comprising a means for driving a plurality signals on a plurality of input buses and a plurality of crosspoint means for sensing signals on the input buses and driving signals on a plurality of output buses (figure 5, col. 3 lines 50-60) but is however silent on teaching the use of low swing signals on the input and output buses. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver invention teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19).

It would have been obvious to one of ordinary skill in the art to have input and output busses driven at low swing in Upp as evidenced by Bridgewater, Jr. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches low-voltage swing input and output busses and low-voltage swing busses are widely used in the art as a means of lowering the power consumption switching circuitry.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. 6034551 and further in view of Dupcak et al. U.S Patent 6414520.

Regarding claims 2, Upp in view of Bridgewater, Jr. is silent on teaching each crosspoint switch comprises an amplifier. Dupcak et al. in an art related Universal Low Swing Sense Amplifier invention teaches amplifiers for use with low voltage swing signals (col. 3 lines 44-45).

It would have been obvious to one of ordinary skill in the art for each crosspoint to comprise an amplifier in Upp in view of Bridgewater, Jr. as evidenced by Dupcak et al. because Upp in view of Bridgewater, Jr. suggests a crosspoint switch having low swing inputs and outputs and Dupcak et al. teaches amplifiers for use with low voltage swing signals to detect and latch the input signal.

Claims 4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of McClure U.S Patent 5627793.

Regarding claim 4, Upp in view of Bridgewater teaches a crosspoint switch comprising a plurality of input and output busses (figure 1, U.S Patent 4914429) and the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19, U.S Patent 6034551) but is silent on teaching a clocked regenerative amplifier. McClure in an art related

invention in the same field of endeavor of semiconductor devices teaches the used of a clocked amplifier (72) in the output circuitry for driving the signal onto a bus (col. 5 lines 38-41).

It would have been obvious to one of ordinary skill in the art to have a clocked regenerative amplifier in Upp in view of Bridgewater as evidenced by McClure because Upp in view of Bridgewater suggests a crosspoint switch comprising a plurality of input and output busses and the use of low-voltage swing differential drivers and low-voltage swing receiver which drives signal onto a data bus and McClure teaches the use of a clocked amplifier in the output circuitry for driving the signal onto a bus.

Regarding claim 8, Upp in view of Bridgewater teaches a crosspoint switch comprising a plurality of input and output busses (figure 1, U.S Patent 4914429) and the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19, U.S Patent 6034551) but is silent on teaching a plurality of clocked regenerative amplifier. McClure in an art related invention in the same field of endeavor of semiconductor devices teaches the used of a clocked amplifier (72) in the output circuitry for driving the signal onto a bus (col. 5 lines 38-41) and one skilled in the art recognizes that the multiple output requires multiple output drivers and each driver is associated with a clocked amplifier as evidenced by McClure.

It would have been obvious to one of ordinary skill in the art to have a plurality of clocked regenerative amplifiers in Upp in view of Bridgewater as evidenced by McClure because Upp in view of Bridgewater suggests a crosspoint switch comprising a plurality of input and output busses and the use of low-voltage swing differential drivers and low-voltage swing receiver which drives signal onto a data bus and McClure teaches the use of a clocked amplifier in the output circuitry for driving the signal onto a bus and one skilled in the art recognizes that

the multiple output requires multiple output drivers and each driver is associated with a clocked amplifier as evidenced by McClure.

Regarding claim 9, Upp is silent on teaching the signals on the input buses and the output buses are differential signal. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19).

It would have been obvious to one of ordinary skill in the art for the signals on the input buses and the output buses are differential signal in Upp as evidenced by Bridgewater, Jr. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches the differential input and output signals in order to reduce power consumption of the input and output busses.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of Lukes et al. U.S Patent 6218901.

Regarding claim 7, Upp in view of Bridgewater, Jr. teaches low swing differential drivers (U.S Patent 6034551, col. 3 lines 17-19) but is silent on teaching drivers with push-pull driver circuits driving a pair of differential lines. Luke et al. in an art related High Speed Differential Output Driver invention teaches push-pull driver circuits driving a pair of differential lines (col. 1 lines 65-66).

It would have been obvious to one of ordinary skill in the art to have with push-pull driver circuits driving a pair of differential lines in Upp in view of Bridgewater, Jr. as evidenced

by Lukes et al. because Upp in view of Bridgewater, Jr. suggests a crosspoint switch having low swing differential drivers and Luke et al. teaches push pull drivers driving differential signals in order to increase bus performance and to reduce the power requirement of the circuitry.

Claims 10, 13-14, 16, 18, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of Dupcak et al. U.S Patent 6414520.

Regarding claims 10 and 13, Upp teaches a crosspoint switch (figure 1) comprising a plurality of input and output busses (figure 1) with each crosspoint selectively passing a signal from an input bus to an output bus (col. 3 lines 60-63). Upp is however silent on teaching a plurality of low swing drivers driving a pair of differential lines and each crosspoint comprising an amplifier which amplifies a signal on an input bus. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19) but is also silent on teaching each crosspoint comprising an amplifier which amplifies a signal on an input bus and a plurality of output amplifiers which sense the signals on the output buses. Dupcak et al. in an art related Universal Low Swing Sense Amplifier invention teaches amplifiers for use with low voltage swing signals (col. 3 lines 44-45).

It would have been obvious to one of ordinary skill in the art to have plurality of low swing drivers driving a pair of differential lines and each crosspoint comprising an amplifier which amplifies a signal on an input bus in Upp as evidenced by Bridgewater, Jr. in view of Lukes et al. because suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches the use of low-voltage low voltage swing driver in order to improve

bus performance because the amount of time to generate a voltage differential is significantly less than the time required to transition from the supply voltage to the zero level and Dupcak et al. further teaches amplifiers for use with low voltage swing signals to detect and latch the input and output signal.

Regarding claims 16 and 19, Upp is silent on teaching the signals on the input buses and the output buses are differential signals. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver teaches the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19).

It would have been obvious to one of ordinary skill in the art for the signals on the input buses and the output buses are differential signals in Upp as evidenced by Bridgewater, Jr. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches the use of low-voltage low-voltage swing receiver in order to improve bus performance because the amount of time to generate a voltage differential is significantly less than the time required to transition from the supply voltage to the zero level.

Regarding claim 20, Upp teaches a method of connecting signals from a plurality of input buses to a plurality of output buses (figure 1) but is silent on teaching driving signals on the input buses through a plurality of low swing drivers with each low swing drivers driving a pair of low swing pair of differential lines, using amplifier to amplify signal on the input buses and sensing the low swing signals on the output buses with amplifiers. Bridgewater, Jr. in art related Low Voltage Differential Dual Receiver invention teaches a bus using of low-voltage swing

differential drivers and low-voltage swing receiver (col. 3 lines 17-19) but is also silent on teaching amplifier to amplify signal on the input buses and sensing the low swing signals on the output buses with amplifiers. Dupcak et al. in an art related Universal Low Swing Sense Amplifier invention teaches amplifiers for use with low voltage swing signals for amplifying the signal on the input buses and sensing the low swing signals on the output buses with amplifiers (col. 3 lines 44-45).

It would have been obvious to one of ordinary skill in the art for the signals on the input buses and the output buses are differential signals and amplifier to amplify signal on the input buses and sensing the low swing signals on the output buses with amplifiers in Upp as evidenced by Bridgewater, Jr. in view of Lukes et al. because Upp suggests a crosspoint switch having a plurality of input and output busses and Bridgewater, Jr. teaches the use of low-voltage low-voltage swing receiver in order to improve bus performance because the amount of time to generate a voltage differential is significantly less than the time required to transition from the supply voltage to the zero level. Dupcak et al. further teaches amplifiers for use with low voltage swing signals to detect and latch the input signal.

Claims 11-12, 14-15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 in view of Dupcak et al. U.S Patent 6414520 and further in view of McClure U.S patent 5627793.

Regarding claims 11 and 15, Upp in view of Bridgewater in view of Dupcak et al. teaches a crosspoint switch with timing means (col. 6 lines 24-30, U.S Patent 4914429) but is silent on

teaching timing circuit which controls timing of the crosspoint switch from a clock and the timing circuit includes a delay. McClure in an art related clock generation circuit invention teaches timing circuit which control the timing of a clock and includes a delay (col. 5 lines 31-35) for controlling the clock timing.

It would have been obvious to one of ordinary skill in the art to have timing circuit which controls timing of the crosspoint switch from a clock and the timing circuit includes a delay in Upp in view of Bridgewater in view of Dupcak et al. as evidenced by McClure because Upp in view of Bridgewater in view of Dupcak et al. suggests a crosspoint switch with timing means and McClure teaches a timing means includes a timing circuit which control the timing of a clock and includes a delay for controlling the clock timing.

Regarding claims 12, 14 and 18, Upp in view of Bridgewater teaches a crosspoint switch comprising a plurality of input and output busses (figure 1, U.S Patent 4914429) and the use of low-voltage swing differential drivers and low-voltage swing receiver (col. 3 lines 17-19, U.S Patent 6034551) but is silent on teaching a clocked regenerative amplifier. McClure in an art related invention in the same field of endeavor of semiconductor devices teaches the used of a clocked amplifier (72) in the output circuitry for driving the signal onto a bus (col. 5 lines 38-41).

It would have been obvious to one of ordinary skill in the art to have a clocked regenerative amplifier in Upp in view of Bridgewater as evidenced by McClure because Upp in view of Bridgewater suggests a crosspoint switch comprising a plurality of input and output busses and the use of low-voltage swing differential drivers and low-voltage swing receiver

which drives signal onto a data bus and McClure teaches the use of a clocked amplifier in the output circuitry for driving the signal onto a bus.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of Lukes et al. U.S Patent 6218901.

Regarding claim 17, Upp in view of Bridgewater, Jr. teaches low swing differential drivers (U.S Patent 6034551, col. 3 lines 17-19) but is silent on teaching drivers with push-pull driver circuits driving a pair of differential lines. Luke et al. in an art related High Speed Differential Output Driver invention teaches push-pull driver circuits driving a pair of differential lines (col. 1 lines 65-66).

It would have been obvious to one of ordinary skill in the art to have with push-pull driver circuits driving a pair of differential lines in Upp in view of Bridgewater, Jr. as evidenced by Lukes et al. because Upp in view of Bridgewater, Jr. suggests a crosspoint switch having low swing differential drivers and Luke et al. teaches push pull drivers driving differential signals in order to increase bus performance and to reduce the power requirement of the circuitry.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of Fletcher U.S Patent 6392466.

Regarding claim 22, Upp in view of Bridgewater teaches input buses and output buses with differential data lines (col. 3 lines 17-19, U.S Patent 6034551) but is silent on teaching the data lines comprises precharge circuits that share charge between the data lines to a midpoint of voltage swing. One skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher (col. 2 lines 19-35) in order to improve the delay characteristics of the data lines.

It would have been obvious to one of ordinary skill in the art for the data lines to comprise precharge circuits that share charge between the data lines to a midpoint of voltage swing in Upp in view of Bridgewater as evidenced by Fletcher because Upp in view of Bridgewater suggests input buses and output buses with differential data lines and one skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher in order to improve the delay characteristics of the data lines.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Upp U.S Patent 4914429 in view of Bridgewater, Jr. U.S Patent 6034551 and further in view of Dupcak et al. U.S Patent 6414520.

Regarding claim 23, Upp in view of Bridgewater and further in view of Dupak et al. teaches input buses and output buses with differential data lines (U.S Patent 6034551, col. 3 lines 17-19) but is silent on teaching the data lines comprises precharge circuits that share charge between the data lines to a midpoint of voltage swing. One skilled in the art recognizes that it is

conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher (col. 2 lines 19-35) in order to improve the delay characteristics of the data lines.

It would have been obvious to one of ordinary skill in the art for the data lines to comprise precharge circuits that share charge between the data lines to a midpoint of voltage swing in Upp in view of Bridgewater and further in view of Dupak et al. as evidenced by Fletcher because Upp in view of Bridgewater and further in view of Dupak et al. suggests input buses and output buses with differential data lines and one skilled in the art recognizes that it is conventional practice to have precharge circuits at a particular voltage that share charge between data as evidenced by Fletcher in order to improve the delay characteristics of the data lines.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vernal U Brown whose telephone number is 703-305-3864. The examiner can normally be reached on M-Th, 8:30 AM-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on 703-305-4704. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-6743 for regular communications and 703-308-6743 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Vernal Brown
June 4, 2003

MICHAEL HORABIK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600